classification drawn up by Dr. Lutz, no changes have been made in this volume. The Corethrinæ have, however, been excluded from the Culicidæ and raised to family rank, partly on account of the asiphonate character of the larvæ, but mainly by the absence of piercing mouth-parts and of scales in the adults.

Felt's[1] new method of classification, based upon the genital armature of the males and the wing venation, is discussed at some length, but abandoned as unpractical on the grounds (1) that the majority of known mosquitoes are females only, and thus we should not be able to place many of our well-known species in any genus; and (2) that the cross-veins in the venation of the wings are subject to so great a variation that generic characters cannot be fixed by them. The author also points out that Messrs. Dyar and Knab's[2] unusual classification of the Culicidæ by larval characters only cannot be admitted. We need scarcely point out that any radical changes in the classification of these insects will result in endless confusion, especially so if based mainly upon local knowledge; and as practically all British, French and South American doctors and entomologists have adopted the Theobaldian classification, anything more than a modification of this system would be followed by somewhat disastrous results, especially among the students of the medical profession who are engaged in the study of the Culicidæ in connection with tropical diseases.

In the general notes we find a reference to Major Adie's evidence as to the benefit of *Lemma minor,* L., as a means of preventing mosquitoes from laying their eggs on water. He states that "tanks covered with this flat weed never contain larvæ of Culicidæ, whilst others at the same time of year are full of them." This genus of plants has apparently the same marked effect upon the frequency of both Anopheles and Culex in this country.

The natural reservoirs formed by the flowers of *Heliconia brasiliensis,* Hook., in Ceylon, the leaves of Nepenthes and various Bromeliaceous plants and the cut ends of bamboo in South America, are given as the breeding places of both Anophelines and Culicines. Mr. E. E. Green, of Ceylon, has contributed some notes on *Myzomyia rossii,* Giles, which he found breeding in the brackish lake at Batticaloa. There are also some interesting notes on the bionomics of *Nyssorhynchus fuliginosus*; but apart from these and a few other references to the habits of mosquitoes, very little is known of the earlier stages of a large proportion of the Culicidæ, so that those who have the opportunity of observing these insects have the pleasure of discovery before them.

In a work which has been so admirably performed, it is invidious, perhaps, to direct attention to any errors either of omission or commission, but we note that Patton's[3] important paper in which he describes five new species of Anophelinæ has been quite overlooked, nor do we find any reference to Grünberg's[4] new Anophelines described in 1905. *Myzomyia hebes,* Dönitz (p. 42); *Cellia punctulata,* Dönitz (p. 109); and *Howardina chrysolineata,* Theob. (p. 218), are all omitted from the synoptical tables; while *Pyretophorus pitchfordi,* Power (p. 72), and *Nyssorhynchus indiensis,* Theob. (p. 98), are omitted both from the synoptical tables and the lists of species given under the respective genera.

Myzomyia listoni, Liston, is given priority on pp. 41, 43, but is sunk to the position of a synonym of *M. christophersi,* Theob., on p. 51. Under *Culicada fitchii,* Felt and Young (p. 321), Fig. 112 is described as *Grabhamia fitchii*; there are also some minor errors in the text, evidently printer's.

R. N.

COMMERCIAL ORGANIC ANALYSIS.

Commercial Organic Analysis. By A. H. Allen. Vol. ii., part iii. Pp. xii + 547. Third edition, re-written and revised by the Author and A. R. Tankard. (London: J. and A. Churchill, 1907.) Price 20*s*.

Henry

WITH the publication of this volume, the whole of this standard work on the analysis of organic materials occurring in commerce is again available in a revised form. The preparation of this portion was undertaken by Mr. Allen so long ago as 1898, but, owing to his ill-health, little progress was made, and after his untimely death in 1904 the completion of the book was undertaken by Mr. Tankard.

The recent considerable additions to our knowledge of volatile oils, rubbers, gutta-perchas, and resins, the four principal groups of products now dealt with, have necessitated extension of the space devoted to these subjects in previous editions. As regards resins and volatile oils the author was assisted by Mr. E. J. Parry, and in the preparation of the article on oil of turpentine Mr. Archbutt was consulted, whilst Dr. Leffmann, of Philadelphia, contributed a portion of the section on aromatic acids and their hydroxy-derivatives.

The method of treatment adopted is to give a short critical *résumé* of the present position of the chemistry of each product, followed by a summary of the analytical methods available for its examination, one or more of these being finally recommended as giving trustworthy results in the author's own experience.

In spite of the care which has evidently been taken to secure accuracy in the information given, the specialist will be able to find here and there in the sections in which he is particularly interested statements requiring emendation or amplification. Thus the important matter of the botanical sources of rubber should not have been dismissed in the statement that it is "obtained from the latex of trees growing in S. America, Africa, India, &c.," supplemented by the inaccurate footnote, "A *new* source of caoutchouc has been recently discovered in the root-bark of *Landolphia thrallonii,* a plant growing in Lower Guinea and the French Congo." The statement that gutta-percha occurs in the latex of various trees belonging to the Sapotaceæ (*e.g. Palaquium pustulata* and other species) is all the information vouchsafed regarding the source of this important product, and is misleading since the best gutta is obtained from *Palaquium gutta, P. pustulata* yield-

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[1] Bull. 79, Ent. 22. New York State Museum. (1904.)

[2] "The Larvæ of Culicidæ classified as Independent Organisms." Journ. New York Ent. Soc., vol. xiv., pp. 169–230. (1906.)

[3] Journ. Bombay Nat. Hist. Soc., 1905.

[4] Zool. Anzeiger, Bd. xxix., No. 12, September, 1905.

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ing an inferior product of little commercial value. There is a reference on p. 384 to "Spanish oil of hops" or "Cretan oil of marjoram," described as obtained from *Origanum hirsutum* and *O. creticum*. This appears to refer to the material better known in this country as "Cretan origanum" or "red thyme" oil, which is generally believed to be obtained from *Origanum hirtum*. The tabular statement of the constituents of volatile oils is incomplete in some respects; thus, under "basil oil," there is no reference to the terpene ocimene isolated by van Romburgh from this source in 1901; and the information given under the head of "applications" in these tables is in some cases rather inadequate.

There is a reference in the list of "errata and addenda" to the recent confirmation by the Philippine Bureau of Science of Trimen and Bentley's statement that "elemi" is obtained from *Canarium luzonicum*, but, curiously enough, the generic name is wrongly given as Conarium.

The arrangement of the subject-matter adopted facilitates reference to the information given regarding most of the products described, but it would have been an advantage if a fuller index had been provided.

As a guide to the analysis of commercial vegetable products this book fully maintains the high standard set in previous editions, and those concerned in its revision are to be congratulated on the satisfactory way in which they have accomplished their work.

T. A. H.

SCIENTIFIC ASPECTS OF PHOTOGRAPHY.

Investigations on the Theory of the Photographic Process. By Dr. S. E. Sheppard and Dr. C. E. Kenneth Mees. Pp. x+342. (London: Longmans, Green and Co., 1907.) Price 6*s*. 6*d*. net.

Chapman Jones

DURING the last four years the authors have been working with the object of preparing theses for their degrees according to the regulations of the University of London, and in this volume they present in order the records of their work by republishing together their communications to several scientific societies. That particular branch of photography that the authors refer to as *the* photographic process is the exposure, development, fixation, and sensitometry of gelatino-bromide plates—in short, negative making as now understood, but without reference to the after-treatment of the fixed plate by such processes as intensification, or to such collateral matters as the production of developer stains.

As indicated by the title, the volume is theoretical rather than practical, though the results often have an important practical significance. The subjects are dealt with from the point of view of what is now understood as physical chemistry, and the work is described in the language of that branch of science. This will make the volume probably more acceptable to students interested in photography who have devoted themselves specifically to physical chemistry, but it imposes a serious difficulty in the way of those who have not. This difficulty is increased by the constant use of symbols instead of words in the text. We would suggest the addition of a glossary giving the exact meaning of each of the symbols used.

Some of the apparatus used appears to be disadvantageously complex. For measuring opacities a spectrophotometer is employed, though dispersion of the light is unnecessary, and appears to be undesirable, for it must add sources of error. The authors use the bright green part of the spectrum, but do not say why they throw away the rest. They recognise the fact that the light transmitted by the silver deposits in films is largely scattered, and that their instrument takes very little cognisance of scattered light. They apparently assume that the scattered light generally bears a constant proportion to the whole, but it is very doubtful whether such an assumption is well founded. On certain occasions the authors endeavour to obviate the error due to scattering by making the film itself the practical light-source by means of a diffusing medium, placed in contact with it. Opal glass, which they use, is probably the best diffusing medium available, but the present writer does not call to mind any proof that it is thoroughly effective for such a purpose. Other methods of measurement are well known that do not suffer from these drawbacks.

The authors deal with many questions that are of a very debatable character, and it in no sense belittles their work to say that they remain debatable. They adopt the "germ" theory of the developable image, but limit the effect of each germ to the grain or nodule of which it forms a part. The "suspicion of a vicious circle in the argument" that the authors refer to in connection with the "molecular strain" theory is, we fear, much more widely applicable than they appear to realise. The authors remark that "it may be said of the physical theories that they shirk a real explanation by treating the phenomena to be explained as a quality of the physical modification of the halide"; to which one might reply that those who advocate the chemical theories assume a decomposition of which there is no evidence. And so it remains a matter of opinion as to which is the safer and more useful hypothesis. We make only one other observation, namely, that it seems undesirable to speak of the *law* of constant density ratios, when, as the authors themselves admit, it is "frequently not followed." When this "law" was first propounded by Messrs. Hurter and Driffield they maintained that it was really a *law*, which it was very difficult, if possible, to get away from.

This volume will find a place, which it will worthily fill, in the libraries of all who are interested in the scientific aspects of photography, because it contains the record of a series of carefully conducted experiments under stated conditions, and gives copious references to the literature of the subject.

C. J.

OUR BOOK SHELF.

Surgical Instruments in Greek and Roman Times. By Dr. John Stewart Milne. Pp. xii+187; illustrated. (Oxford: The Clarendon Press, 1907.) Price 14*s*. net.

Dr. D'Arcy Power

BOTH the author and the Clarendon Press are to be congratulated on the issue of this very valuable work—Dr. Milne because it represents work well done, and the Press on account of the successful manner in which

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